

~~segmentation, or motion analysis, and (iv) as a basis for digital algorithms for solving ordinary and partial differential equations in science, engineering, economics, and other disciplines.~~

34.(currently amended) A method system for analyzing data comprising the steps of:
constructing at least one isotropic, non-separable wavelet including:
isotropic, non-separable filters having at least one ideal isotropic, non-separable
window and necessary translation and dilation operators, where the filters are
selected from the group consisting of low pass isotropic, non-separable filters, high
pass isotropic, non-separable filters and isotropic, non-separable filters that cover a
desired frequency range or plurality of frequency ranges;
isotropic scaling functions and associated translation operators for use with low pass
the scaling functions; and
resolving or decomposing a multidimensional signal into various a plurality of non-
overlapping subsets or resolution levels with the at least one isotropic, non-separable wavelet.

45.(currently amended) The method of claim 14, further comprising the step of:
dividing each isotropic, non-separable filter into at least one relative low pass isotropic, non-
separable component and at least one relative high pass isotropic, non-separable components.

56.(currently amended) The method of claim 14, wherein the method is used in
multidimensional signal is: (i) data compression and storage for a streaming video signal, a seismic
imaging signal, or a digital medical imaging signal of all types, (ii) image and signal enhancement,
denoising and analysis for medical imaging, seismic imaging, a satellite imaging signal, and a
surveillance imaging signal, a target acquisition imaging signal, a radar imaging signal, a sonar
imaging signal, or a pattern recognition imaging signal and analysis, (iii) volume rendering and
segmentation, or motion analysis, and (iv) as a basis for digital algorithms for solving ordinary and
partial differential equations in science, engineering, economics, and other disciplines.

67.(currently amended) A system for processing signals implemented on a computer
comprising:
a processing unit having encoded thereon a completely isotropic, non-separable ideal filter

4 for frame multi-resolution analysis software including:

5 wavelets adapted to resolve a multidimensional signal into various resolution levels,

6 where the wavelets are derived from:

7 isotropic, non-separable ideal windows or filters in a dimension greater than
8 or equal to 1,

9 translation and dilation constructs or operators adapted to form completely

10 isotropic, non-separable low pass filters, isotropic, non-separable high pass

11 filters and isotropic, non-separable filters that cover a desired frequency range

12 or plurality of frequency ranges from the isotropic ideal windows into; and

13 isotropic, non-separable scaling functions and associated translation operators

14 for use with the low pass scaling functions;

1 78.(currently amended) The system of claim 67, wherein each isotropic, non-separable high
2 pass and each isotropic, non-separable low pass filter comprise:

3 at least one isotropic, non-separable relative low pass component and at least one isotropic,
4 non-separable relative high pass component.

1 89.(currently amended) The system of claim 78, wherein each isotropic, non-separable relative
2 high pass component and each isotropic, non-separable relative low pass filter comprise:

3 at least one isotropic, non-separable relative low pass subcomponent and at least one
4 isotropic, non-separable relative high pass subcomponent.

1 910.(currently amended) The system of claim 67, wherein each isotropic, non-separable high
2 pass and each isotropic, non-separable low pass filter comprise:

3 a plurality of isotropic, non-separable high pass and isotropic, non-separable low pass
4 components, each component including at least one isotropic, non-separable relative low pass
5 subcomponent and at least one isotropic, non-separable relative high pass subcomponent.

1 1011.(currently amended) A completely isotropic, intrinsically non-separable low pass filter or
2 high pass filter implemented on a computer comprising:

3 isotropic, non-separable ideal windows in a dimension greater than or equal to 1, and

translation and dilation operators adapted to form out of the ideal windows completely isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges from the isotropic ideal filters.

1112.(currently amended) The filter of claim **1111**, wherein the isotropic, non-separable low pass filter comprises:

$$m_0(\xi) = \sqrt{2} \chi_{D/\sqrt{2}}(\xi), \xi \in \mathbb{T}^2.$$

1113.(currently amended) A completely isotropic, intrinsically non-separable scaling functions implemented on a computer comprising:

$$\phi = F^{-1}(\chi_{D_r})$$

1114.(currently amended) An isotropic, non-separable wavelet scaling functions implemented on a computer comprising:

$$\phi(R) = \frac{J_{n/2}(\pi R)}{(2R)^{n/2}}, \quad R > 0 \quad (2)$$

1115.(currently amended) An isotropic, non-separable wavelet implemented on a computer comprising:

at least one isotropic, non-separable filter including at least one isotropic, non-separable ideal window and translation and dilation operators, where the filters are selected from the group consisting of isotropic, non-separable low pass filters, isotropic, non-separable high pass filters and isotropic, non-separable filters that cover a desired frequency range or plurality of frequency ranges; and

constructing isotropic scaling functions and associated translation operators for use with the low pass scaling functions.

1116.(currently amended) The filter wavelet of claim **1115**, wherein the wavelet further comprises:

$$h_r = e_{q_r} \chi_Q \quad r \in \{0, 1, \dots, p-1\} \quad (15)$$

where $\{e_{A(k)} h_r : k \in \mathbb{Z}^n, r = 0, 1, \dots, p-1\}$ is a Parseval frame for $L^2(Q)$ and for \hat{W}_{-1} ,

$\{T_{A(k)} F^{-1} h_r : k \in \mathbb{Z}^n, r = 0, 1, \dots, p-1\}$ is a Parseval frame for W_{-1} , $\psi_r = D \mathcal{T}^{-1} h_r$ ($r = 0, 1, \dots, p-1$),

$\{T_k \psi_r : k \in \mathbb{Z}^n, r = 0, 1, \dots, p-1\}$ is a Parseval frame for W_0 , and $\{\psi_r : r = 0, 1, \dots, p-1\}$ is a Parseval

frame multiwavelet set associated with the FMRA $\{V_j\}_j$.

17.(new) The method of claim 1, further comprising the step of
decomposing the multidimensional signal into a plurality of non-overlapping subsets or
resolution levels using an equal plurality of isotropic, non-separable wavelets from the isotropic,
non-separable filters and the isotropic, non-separable scaling functions.

18.(new) The method of claim 17, further comprising the step of
reconstructing a reconstructed multidimensional signal from the plurality of non-overlapping
subsets or resolution levels, where the reconstructed multidimensional signal has enhanced boundary
properties and has reduced noise.